THE NEW ERA OF PC GAMING

THE GAMES WE ARE PLAYING

- More AAA Games
- Bigger Budgets
- Increasing Sales Figures
- More Memory Bandwidth Required

THE WAY WE PLAY THEM

- Higher Resolutions (4K)
- Higher Refresh Rate
- New Peripherals
- Virtual Reality

WHY WE ARE PLAYING THEM

- As Professional Athletes
- As Twitch Personalities
- For Social Gaming

| AMD RADEON™ GRAPHICS | JUNE 2015 | APPROVED FOR ALL AUDIENCES |AMD|
THE NEW ERA OF PC GAMING

THE GAMES WE ARE PLAYING

“PC gaming hardware accounted for 1/3 of the global gaming hardware market in 2014 - a total of $22.1 billion last year.” – JPR

THE WAY WE PLAY THEM

Virtual reality market is expected to grow by over 13,000% in the next 3 years.¹

WHY WE ARE PLAYING THEM

$35 Million in Prize Pools*

Twitch’s peak viewership rivaling prime time averages**

AMD RADEON™ GRAPHICS PRODUCTS LINEUP

AMD RADEON™ 300 SERIES AND AMD RADEON™ R9 FURY X GPU

- AMD Radeon™ R9 Fury X
- AMD Radeon™ R9 390X
- AMD Radeon™ R9 390
- AMD Radeon™ R9 380
- AMD Radeon™ R7 370
- AMD Radeon™ R7 360
- AMD Radeon™ R7 250

*Not representative of explicit performance or price
**AMD Features and Technologies**

*For the most demanding players*

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**High-Bandwidth Memory (HBM)**

High-performance memory standard with vertically stacked DRAM dies. HBM enables superior bandwidth at lower power consumption than GDDR5.\(^2,3\)

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**AMD FreeSync™ Technology**

AMD’s unique hardware/software platform that synchronizes the update rate of a monitor to your favorite game, eliminating tears and choppiness for effortlessly smooth gameplay.\(^4\)

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**Virtual Super Resolution**

Re-renders games at higher resolutions (up to 4K-quality) and then dynamically rescales them for HD displays at higher quality and details.\(^5\)

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*Support for AMD features and technologies vary with each AMD Radeon™ GPU. Confirm specifications with manufacturer before purchase.*
Microsoft® DirectX® 12 Support

A new, “console-like” graphics API from Microsoft® that better exposes the hardware resources of AMD products to yield higher hardware throughput and, ultimately, more performance for users.⁶

AMD LiquidVR™ Technology

AMD’s pioneering Virtual Reality technology is poised to enable broad compatibility, plug-and-play ease of use, and stable platform support for tomorrow’s VR vendors and technologies.⁷

Gaming Evolved Client

Gaming Evolved Client is an application that uses crowd-sourced data to look for the ideal settings and drivers for your games and your PC.⁸
Frame Rate Target Control (FRTC)
Fine-tune your graphics with real-time frame rate control limiting the target frame rate during gameplay, reducing GPU power consumption.⁹

GCN Architecture
A radically new approach to the design of a consumer GPU. Get more usable processing power, enabling high frame rates in the latest games at higher resolutions and quality settings.¹¹

AMD CrossFire™ Technology
Next Gen AMD CrossFire™ technology enables a bridgeless AMD CrossFire multi-GPU configuration. Double the graphics available for your gaming with AMD CrossFire™ technology without any strings attached.¹⁰

AMD Catalyst™ Omega Driver
AMD Catalyst™ Omega special edition driver delivers enhanced capabilities, additional performance, and even more reliability for your AMD-based PC at no extra cost.

*Support for AMD features and technologies vary with each AMD Radeon™ GPU. Confirm specifications with manufacturer before purchase.
Introducing the AMD Radeon™ R7 300 Series graphics cards

Designed for the most popular online games

**AMD Radeon™ R7 360 Graphics**
- Up to 2GB GDDR5
- DirectX® 12
- Virtual Super Resolution

**AMD Radeon™ R7 370 Graphics**
- Up to 4GB GDDR5
- Gaming Evolved Client

*Board shot shown for illustration purposes only. Final board image may differ.*
AMD RADEON™ R9 380 SERIES GRAPHICS

Design for Great 1440p Gaming Experiences

- Up to 4GB GDDR5
- 256-bit Memory Interface
- PCI Express® 3.0

Highlighted Features:

- AMD FreeSync™ Technology Support
- Virtual Super Resolution
- DirectX® 12 and Vulkan™ Support
- AMD LiquidVR™ Technology
- AMD Crossfire™ Technology
- AMD Eyefinity Technology
- GCN Architecture
- Frame Rate Target Control

* Board shot shown for illustration purposes only. Final board image may differ.
AMD RADEON™ R9 390 SERIES GRAPHICS

Premium 4K gaming and VR within reach—you’re locked and loaded for smooth, true-to-life, stutter-free gameplay with ultra-high performance and resolution. 4,13

- Up to 8GB GDDR5
- 512-bit Memory Interface
- PCI Express® 3.0x16

Highlighted Features:
- AMD FreeSync™ Technology Support4
- GCN Architecture11
- DirectX® 126 and Vulkan™ Support
- Frame Rate Target Control9
- Virtual Super Resolution5
- AMD Crossfire™ Technology10
- AMD Eyefinity Technology12
- AMD LiquidVR™ Technology7

* Board shot shown for illustration purposes only. Final board image may differ.
Introducing the “FIJI” CHIP

Featuring HBM Technology

- High-Bandwidth Memory
- 4096-bit wide interface
- 512 Gb/s Memory Bandwidth
- Graphics Core Next Architecture
- 4096 Stream Processors
- 64 Compute Units
- 596 sq. mm. Engine
- Total ASIC 1011 sq. mm.

DETAILED LOOK
Unprecedented High-Bandwidth Memory

- 60% higher memory bandwidth than Radeon™ R9 290X²

Benefits

- Enables Small Form Factors¹⁵
- >3X Performance per watt³
- Increased bandwidth²
- 4096-bit memory interface

Engineered to meet and exceed the performance demands of 4K and VR gaming⁷,¹³
Introducing the

RADEON™ R9 FURY X GRAPHICS CARD

Like Nothing You’ve Ever Seen Before

- Form Factor Design
- Industrial Design
- Thermal Solution
- High-Bandwidth Memory

Architected to deliver high frame rates and low-latency rendering performance for the ultimate VR experience.7
AMD Radeon™ R9 Fury X Graphics Card
For gamers that the demand the best

SMALL SIZE, GIANT IMPACT
- Incredibly compact graphics cards for small form factor PCs
- 7.5 inch ~19 cm PCB

HIGH CALIBER THERMAL SOLUTION
- Benefit from the cool, quiet, and reliable operation of closed loop liquid cooling, including:
  - Integrated pump
  - 120mm radiator and fan

PREMIUM INDUSTRIAL DESIGN
- High-contrast premium materials
  - Black nickel aluminum exoskeleton
  - Soft-touch aluminum plates
- Monitor real-time GPU activity with the eight-LED GPU Tach activity indicator.
The Products for New Era of PC Gaming

**AMD RADEON™ R7 360 GRAPHICS**

**AMD RADEON™ R7 370 GRAPHICS**

**AMD RADEON™ R9 380 GRAPHICS**

**AMD RADEON™ R9 390 GRAPHICS**

**AMD RADEON™ R9 FURY X GRAPHICS**

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*Board shot shown for illustration purposes only. Final board image may differ.*
COURSE OVERVIEW

- Market Trends and Product Positioning
- AMD Features and Technologies
- AMD Radeon™ Product Introduction
1. Complete the sentence: The AMD Radeon™ R9 Fury X graphics card is positioned for the ____________.
   a) Performance segment
   b) Enthusiast segment
   c) Online segment

2. High-Bandwidth Memory is a new type of memory chip with low power consumption, ultra-wide communication lanes and a revolutionary new stacked configuration.
   a) True
   b) False

3. Complete the sentence: Virtual Super Resolution__________?
   a) Re-renders games at higher resolutions and then dynamically rescales them for HD displays at higher quality
   b) Is AMD's unique hardware/software platform that synchronizes the update rate of a monitor to your favorite game

4. The AMD Radeon™ R9 Fury X graphics card is the world’s first “total solution” GPU with AMD-pioneered High-Bandwidth Memory (HBM) on-chip
   a) True
   b) False

5. According to the information presented, which AMD Radeon™ graphics cards are designed for the most popular online games?
   a) R7 360 and R7 370
   b) R9 380 and R7 370
   c) R9 380 and R9 390
1. Source: Taken on April 2015 from http://uploadvr.com/virtual-reality-market-expected-to-grow-by-over-13000-in-next-3-years-nearly-5-times-faster-than-the-iphone. The iPhone was released in 2007, it sold 1,39 million units, 3 years.

2. Based on the memory bandwidth of the AMD Radeon™ R9 290X with a 1250MHz 512-bit GDDR5 interface (320GB/s) vs. AMD Radeon™ R9 Fury and R9 Fury X featuring HBM with a 500MHz 4096-bit interface (512GB/s). HB4

3. Testing conducted by AMD engineering on the AMD Radeon™ R9 290X GPU vs. the AMD Radeon™ R9 Fury X GPU. Data obtained through isolated direct measurement of GDDR5 and HBM power delivery rails at full memory utilization. Power efficiency calculated as GB/s of bandwidth delivered per watt of power consumed. AMD Radeon™ R9 290X (10.66 GB/s bandwidth per watt) and R9 Fury X (42.66 GB/s bandwidth per watt) GPU, AMD FX-8350, Gigabyte GA-990FX-UD5, 8GB DDR3-1866, Windows 8.1 x64 Professional, AMD Catalyst™ 15.20 Beta. HB5

4. AMD FreeSync™ technology is designed to eliminate stuttering and/or tearing in games and videos by locking a display’s refresh rate to the framerate of the graphics card. Check with your component or system manufacturer for specific capabilities. AMD FreeSync™ technology compatible monitor, AMD Radeon™ Graphics and/or AMD A-Series APU compliant with DisplayPort™ Adaptive-Sync required. AMD Catalyst™ 15.2 Beta (or newer) required. Adaptive refresh rates vary by display; check with your monitor manufacturer for specific capabilities. A list of supported hardware and compatible monitors is available at www.amd.com/freesync. GRAT-2

5. AMD’s Virtual Super Resolution (VSR) feature is offered by the AMD Radeon™ R9 Fury X, R9 390 Series, R9 380, R7 370, R7 360, AMD Radeon™ R9 290 Series and R9 285 graphics cards and is designed to automatically re-render games at higher resolutions and dynamically rescale them for HD displays at higher quality and visual details. Check with your system manufacturer for specific capabilities. GRAT-8

6. DirectX® 12 enablement requires an x86 processor and an AMD Radeon™ graphics chip based on the Graphics Core Next architecture. Windows® 10 Technical Preview 2 (or later) and AMD Catalyst™ driver 15.20 (or later) from Windows Update required. GRT-9

7. When VR headsets are commercially available, users will need to obtain a VR headset compatible with AMD’s GPU technologies and AMD LiquidVR™ technology. See www.amd.com/liquidvr for more information. GRT-6

8. See www.amd.com/raptr for more information on the AMD Gaming Evolved Client, powered by Raptr.

9. Frame rate targeting is offered by select AMD Radeon™ R9 and R7 300 Series graphics and is designed to reduce heat, noise and power consumption by letting users set a target frame rate for their games and applications. Not currently compatible with AMD CrossFire™ multi-GPU configurations. Confirm supported technologies with your component or system manufacturer for specific capabilities before purchase.

10. AMD CrossFire™ technology and/or AMD LiquidVR™ Affinity Multi-GPU technology requires an AMD CrossFire™ technology-ready motherboard and may require a specialized power supply and AMD CrossFire™ Bridge Interconnect (for each additional graphics card). Check with your component or system manufacturer for specific model capabilities. See http://www.amd.com/en-us/innovations/software-technologies/technologies-gaming/crossfire for more information. GRAT-4

11. Select AMD Radeon graphic cards are based on the GCN Architecture and include its associated features (AMD PowerTune technology, AMD ZeroCore Power technology, PCI Express 3.0, etc.). Not all features are supported by all products—check with your system manufacturer for specific model capabilities.
AMD Eyefinity technology supports up to six DisplayPort monitors on an enabled graphics card. Supported display quantity, type and resolution vary by model and board design. Mixed monitors of different resolutions are supported by select AMD Radeon™ R7 Series and R9 Series graphics cards. Confirm specifications with manufacturer before purchase. To enable more than two displays, or multiple displays from a single output, additional hardware such as DisplayPort™-ready monitors or DisplayPort 1.2 MST-enabled hubs may be required. A maximum of two active adapters is recommended for consumer systems. See www.amd.com/eyefinityfaq for full details.

Requires 4K display and content. Supported resolution varies by GPU model and board design; confirm specifications with manufacturer before purchase.

Discrete AMD Radeon™ GPUs and AMD FirePro™ GPUs based on the Graphics Core Next architecture consist of multiple discrete execution engines known as a Compute Unit ("CU"). Each CU contains 64 shaders ("Stream Processors") working in unison. GRT

Measurements conducted by AMD Engineering on 1GB GDDR5 (4x256MB ICs) @ 672mm2 vs. 1GB HBM (1x4-Hi) @ 35mm2. HBM-2

In testing by AMD labs as of April 22, 2015, the AMD Radeon™ R7 370 graphics card (2GB GDDR5) achieved greater than 60fps average on in-game, eSports benchmarks (specifically Counter-Strike: Global Offensive 140fps, Dota 2 88fps, League of Legends 142fps, Starcraft II 84fps) at 2560x1440, ultra-preset (ultra-settings). Tested with Core i7 CPU 5960X (3.0GHz), Gigabyte X99-UD4, 16GB DDR4-2666 MHz, Windows 8.1 64-bit, AMD Catalyst Omega (14.502.150218n) driver. GRDT-42

In testing by AMD labs as of April 22, 2015, the AMD Radeon™ R7 360 graphics card (2GB GDDR5) achieved greater than 60fps average on in-game, eSports benchmarks (specifically Counter-Strike: Global Offensive 148fps, Dota 2 107fps, League of Legends 140fps, Starcraft II 90fps) at 1920x1080, ultra-preset (ultra-settings). Tested with Core i7 CPU 5960X (3.0GHz), Gigabyte X99-UD4, 16GB DDR4-2666 MHz, Windows 8.1 64-bit, AMD Catalyst Omega (14.502.150218n) driver. GRDT-43

Mantle application support is required.
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